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ABSTRACT

Six articles used in previous research (P. A. Goldberg, 1968) into perceived professional competence of women were compared on three different indices of readability. Results indicated that the articles differ in reading ease, writing style, and grade level. This lack of equivalence is posed as a possible explanation of conflicting results that have been reported in previous studies using the articles. (AA)

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Differences in Readability: Its Effects Upon the Interpretation of Past Sex Bias Literature[1]

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In recent years, psychology, among other disciplines, has shown increasing interest in issues concerning the perception of women. One area of research dealing with this concern has been the investigation of perceived feminine professional competence. Specifically, researchers (i.e., Chobot, Goldberg, Abramson & Abramson, 1974; Goldberg, 1968; Levenson, Burford, Bonno, & Davis, 1975; Mischel, 1974; Panek, Deitchman, Burkholder, & Greenawalt, 1976a; Panek, Deitchman, Burkholder, Speroff, & Haude, 1976b) have examined the effect of an author's sex on subject's evaluations of written material. This procedure involves the submission of articles from various professional fields, contained in booklets, to subjects for evaluation. As seen in Table 1, the articles are

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Insert Table 1 About Here
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from fields of differential association, (i.e., traditionally male, and traditionally neutral), which are identical between the booklets. The experimental manipualtion involves the sex of the presumed author of the article. This is accomplished by changing the author's name, that is, in one set of booklets the author is portrayed as a female, while in the other set of booklets the identical article has the name of a male author. The dependent measure used in this type of research are the evaluation scores, based on the questions which follow each article on which subjects rate the author and the article. These questions are identical for all articles and subjects. "Bias" in evaluation is thought to occur or have been demonstrated when the mean evaluation scores given to a particular article are significantly different when the presumed author is designated as a male or female.

Goldberg (1968), using this procedure, found female college students evaluated the articles allegedly written by males more positively than the identical articles attributed to a female author. Results indicated the work of females was not only devalued in the fields traditionally associated with males (city planning and law) and fields of neutral association (art history

and linguistics) but also in fields traditionally associated with women (dietetics and elementary education). Since 1968, numerous investigations using the Goldberg procedure, have failed to replicate his findings (c.f., Baruch, 1972; Chobot et al., 1974; Levenson et al., 1975; Mischel, 1974; Panek et al., 1976a; Panek et al., 1976b). The implications, of course, is that women are not perceived as competent as males, regardless of the field or occupation the women represents. The failure to replicate the findings of Goldberg (1968) has been attributed to factors such as, a change in society's view of feminine work due to the impact of the feminist movement, differences in the subjects used, differences in the articles used, or to a possible interaction of two or more of these factors. Aside from the conflicting results obtained using this procedure (which possibly may be explained by the methodological difficulties just mentioned); potentially, there is an additional methodological problem.

Researchers using the Goldberg procedure interpret their results on the foundation or belief that subject's base their evaluations solely on the basis of the sex of the presumed author; or alternatively, on the basis of a cognitive interaction between the author's sex and the traditional sex association of the professional field. This interpretation overlooks two important issues which have critical importance for this type of research.

First, it may be questionned whether the sex association of the professional fields have remained constant over time. That is, have the traditional sex associations of the various fields changed as a result of social awareness or some other factor since 1968, when Goldberg first developed his procedure. This point has been considered elsewhere by Panek, Rush and Greenawalt (1977).

Secondly, the Goldberg methodology overlooks the fact that there may be qualitative differences between the articles on dimensions such as, reading ease, writing style, and reading grade level required of the subjects for understanding the material. These qualitative differences between articles could possibly have a significant affect on subjects' evaluations and perception of the articles.

As a simplified example, imagine that subjects hold a stereotype which specifies that males are better educated and hence write more complicated material; and that females are less educated and hence complicated material reflects their professional incompetence or inability to express themselves; this, of course, depends on the subjects' reading ability,: what is complicated for some, is easy for others. Assuming that a subject held such a stereotype, it might be expected that a female author of complicated written material would be devalued. Thus the results obtained using this procedure may vary with the reading abilities of the subjects used.

Quantitative differences in the Goldberg articles would suggest a complex confounding of evaluations which would render the interpretation of results obtained using this procedure problematic at best. The purpose of the present study was to investigate this issue. That is, to examine the readability of the articles used by Goldberg and others, to determine whether they are equivalent in reading ease, writing style and required reading grade level.

Method

Materials

There were six articles, one from each of the following professional fields: art history, city planning, elementary education, linguistics, law, dietetics. These articles were those used by Goldberg (1968) and Panek, et al. (1976, a, b).

Procedure

To test the equivalence of the six Goldberg (1968) articles with regard to the properties of reading ease, grade level, and writing style, three different readability indexes were applied to each of the articles. These indexes were the Dale-Chall (1948), the Flesch (1948), and the SMOG (McLaughlin, 1969). As Ash and Edgell (1976) have noted, the factors typically stressed in evaluating readability include: 1) the commonness

of words (whether the words used in the text appear on a list of familiar words); 2) word length (number of letters or syllables); and 3) sentence length.

The Dale-Chall index is based on both the commonness of words and the length of sentences in the reading material, to derive a raw score ranging from 0 to 10+ which correspond to grade levels required for understanding the material. The Flesch index combines a measure of word length and sentence length to derive a score of reading ease. This score places the material on a scale with a range between 0 (practically unreadable) to 100 (easy for any literate person). In addition, at various scale intervals are descriptions of writing style which correspond with the numerical score for reading ease. These range from very difficult to very easy (see Flesch, 1948).

The SMOG index (McLaughlin, 1969) is based on the total number of words of three or more syllables either in the entire text or a selected sample of that text. Applying the SMOG readability formula to the material (see McLaughlin, 1969) gives the SMOG grade, which is considered the reading grade a person must have attained if he or she is to understand the material.

Results

When the Dale-Chall (Dale & Chall, 1948), SMOG (McLaughlin, 1969), and the Flesch (1948) readability indexes were applied to the six Goldberg (1968) articles, the articles differed in grade level, reading ease, and

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writing style, as can be observed in Table 2. Using the Dale-Chall method, the grade levels required for understanding the articles ranged from a low of 9 to 10 (linguistics and dietetics) to a high of 16 (law). With the SMOG index, the grade levels ranged from a low of 11 (dietetics) to a high of 19+ (law). Concerning writing style, three articles were found to

be difficult (art history, elementary education and law) and three were found to be fairly difficult (city planning, linguistics, and dietetics). Although these three methods yielded somewhat different results in some cases, the conclusion remains unaltered. The Goldberg articles are not equivalent with regard to any of the readability criteria investigated. That is, the articles differ in reading ease, writing style, and grade level.

Discussion

On the basis of these findings, it would appear that of the six articles, only three (i.e., art history, city planning, and elementary education) appear to be appropriate for sample composed of college freshman and sophomores--the samples typically used in research utilizing the Goldberg procedure. These articles are thought to be appropriate, since the required reading level is expected to be commensuratewith the average reading ability of the typical sample.

Assuming that qualitative differences between the articles in readability affects subjects' evaluations and perceptions of the articles in an unknown manner, it is recommended that researchers utilizing the Goldberg procedure equate the articles on readability, and in addition, establish a congruence between the articles' required reading level and the subjects' reading ability. Unless these precautions are accomplished, the interpretation of results based on this procedure using the 6 articles may be uninterpretable or at best problematic. Without controlling for the factors of reading ease, writing style, and grade level, future studies of "sex bias" may result in the same type of conflicting results as reported in past literature.

The problem of qualitative differences in readability and a congruence between required reading level and the samples' reading ability is not germane to only the Goldberg procedure. These factors would seem to also warrant consideration in other areas of research investigating systematic

bias and stereotypes; such as, Rosen and Jordee's (1974) research procedure utilizing job resumes in investigating covert sex discrimination.

We feel that establishment of reading equivalence both in terms of the stimulus used, and between the stimuli and the subjects' ability should be adopted in future research in this area.

Table 1

Experimental Conditions

Booklet	Field	Traditional Sexual Association of the Field	Author
A	Art History	Neutral	Joseph W. Banks
	City Planning	Male	Harriet F. Redlich
	Elementary Education	Female	Pauline L. Conger
	Law	Male	Louis M. Morgan
	Linguistics	Neutral	Joan T. McKay
	Dietetics	Female	Stephen E. Hamilton
B	Art History	Neutral	Julie W. Banks
	City Planning	Male	Harry F. Redlich
	Elementary Education	Female	Paul L. Conger
	Law	Male	Lydia M. Morgan
	Linguistics	Neutral	John T. McKay
	Dietetics	Female	Stella E. Hamilton

Table 2

Readability of Each Article by Each Method

Method of Determination of Readability

	Dale-Chall		Flesch		SMOG
Article	Raw Score	Grade Level	Reading Ease	Style	Grade Level
Art History	8.91	11-12	44.87	Difficult	13+
City Planning	8.88	11-12	50.15	Fairly Difficult	13
Elementary Education	8.07	11-12	44.61	Difficult	13
Law	10.04	16	40.36	Difficult	19+
Linguistics	7.19	9-10	55.44	Fairly Difficult	12
Dietetics	7.82	9-10	50.22	Fairly Difficult	11

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